

Remedial
Invest

**NATURE AND
EXTENT**

Q: Is exposure
occurring?

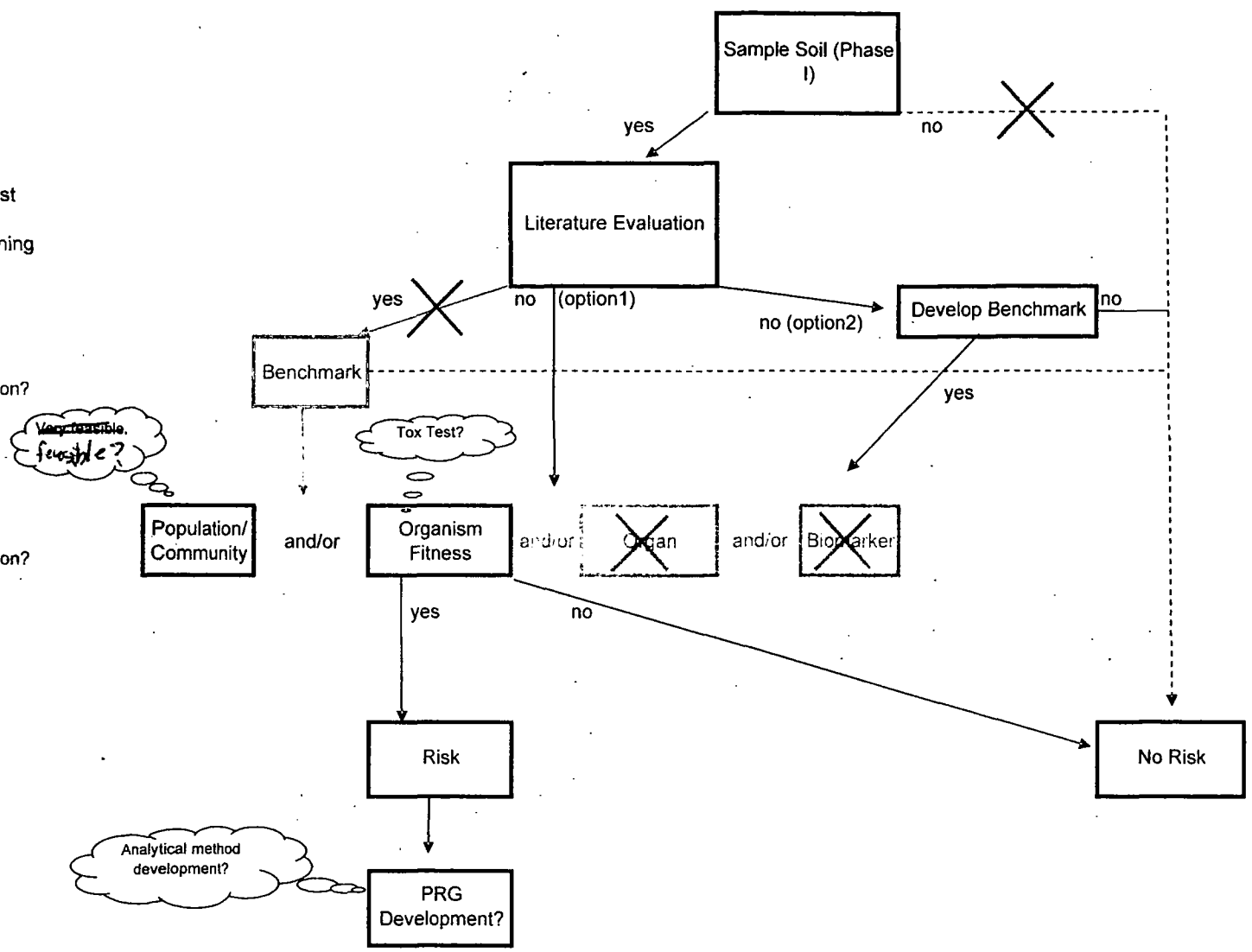
SCREEN

Q: Does data exist
to develop an
acceptable screening
benchmark?

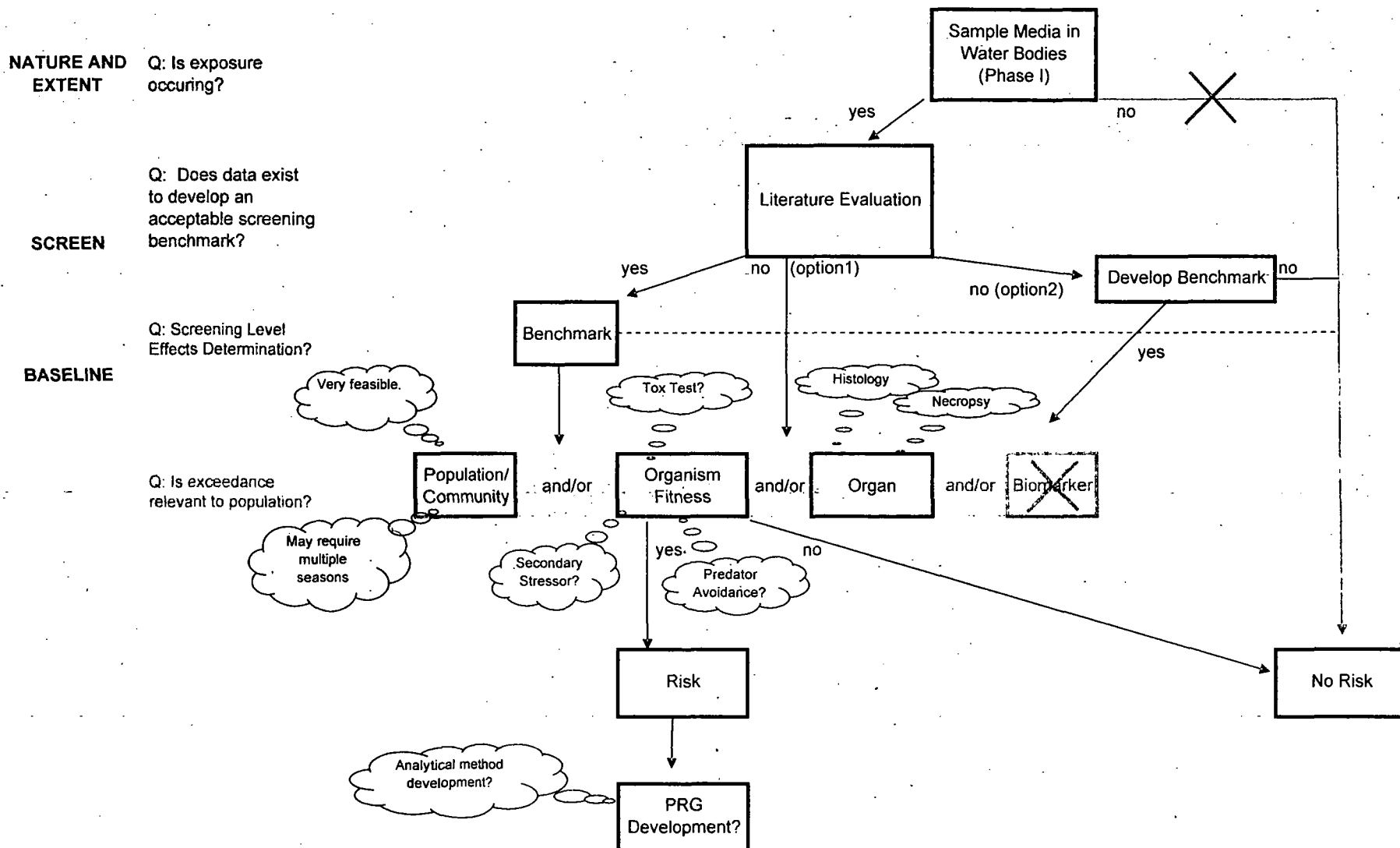
BASELINE

Q: Screening Level
Effects Determination?

Q: Is exceedance
relevant to population?



Aquatic



Q: Is exposure occurring?

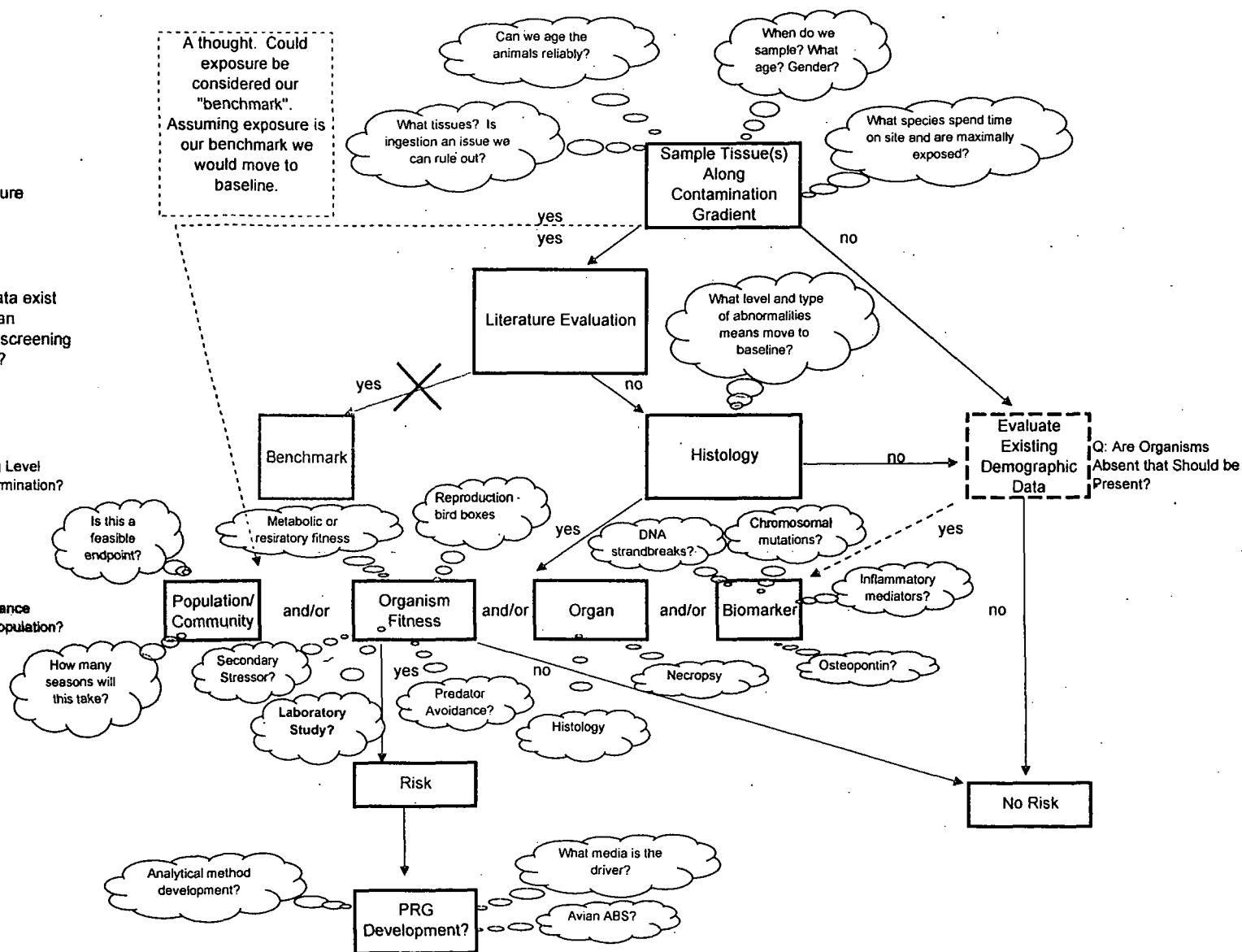
SCREEN

Q: Does data exist to develop an acceptable screening benchmark?

BASELINE

**Q: Screening Level
Effects Determination?**

Q: Is exceedance relevant to population?



Mammal

NATURE AND EXTENT

Q: Is exposure occurring?

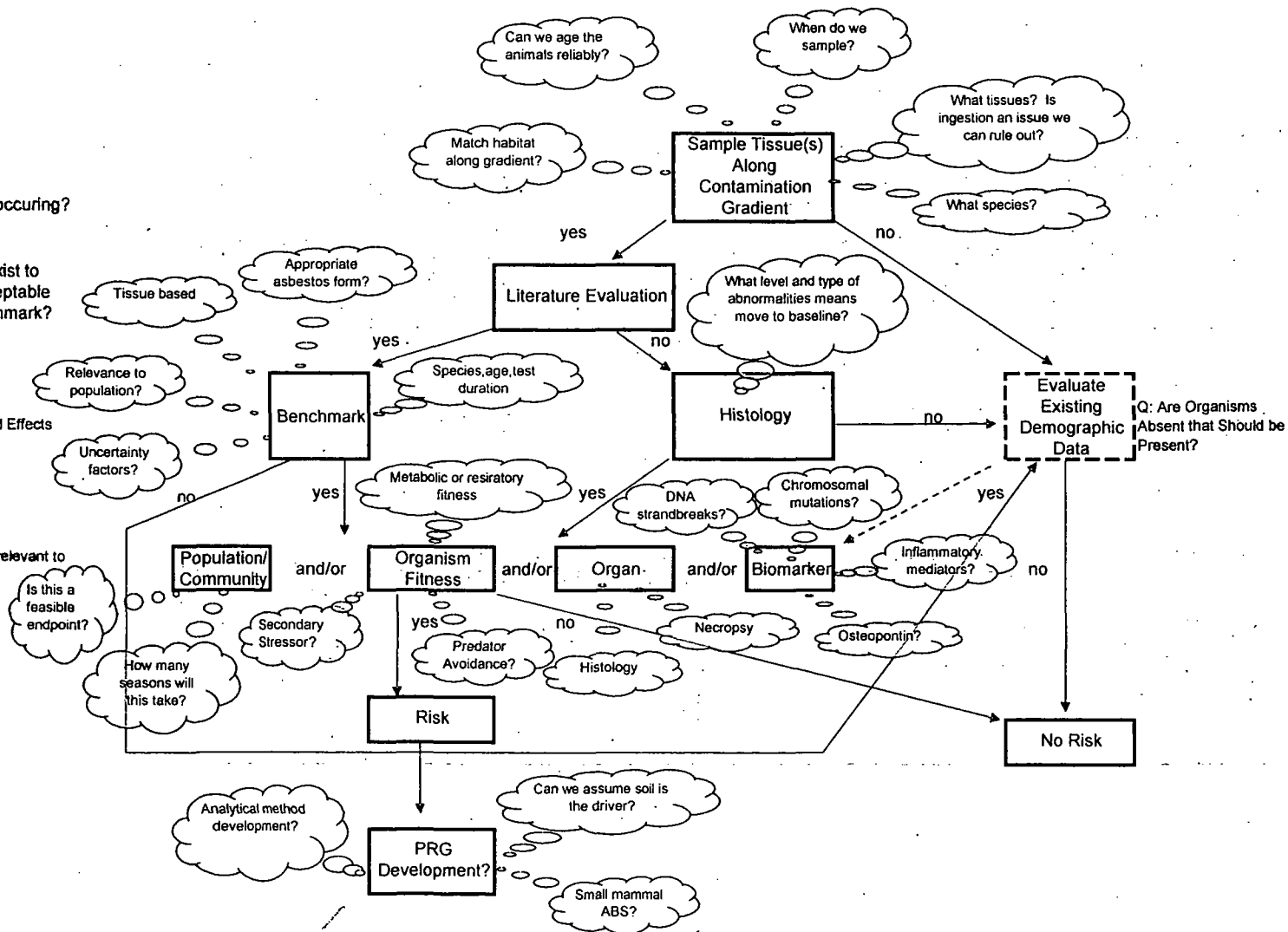
SCREEN

Q: Does data exist to develop an acceptable screening benchmark?

Q: Screening Level Effects Determination?

BASELINE

Q: Is exceedance relevant to population?



Terrestrial Invertebrates

NATURE AND EXTENT

Q: Is exposure occurring?

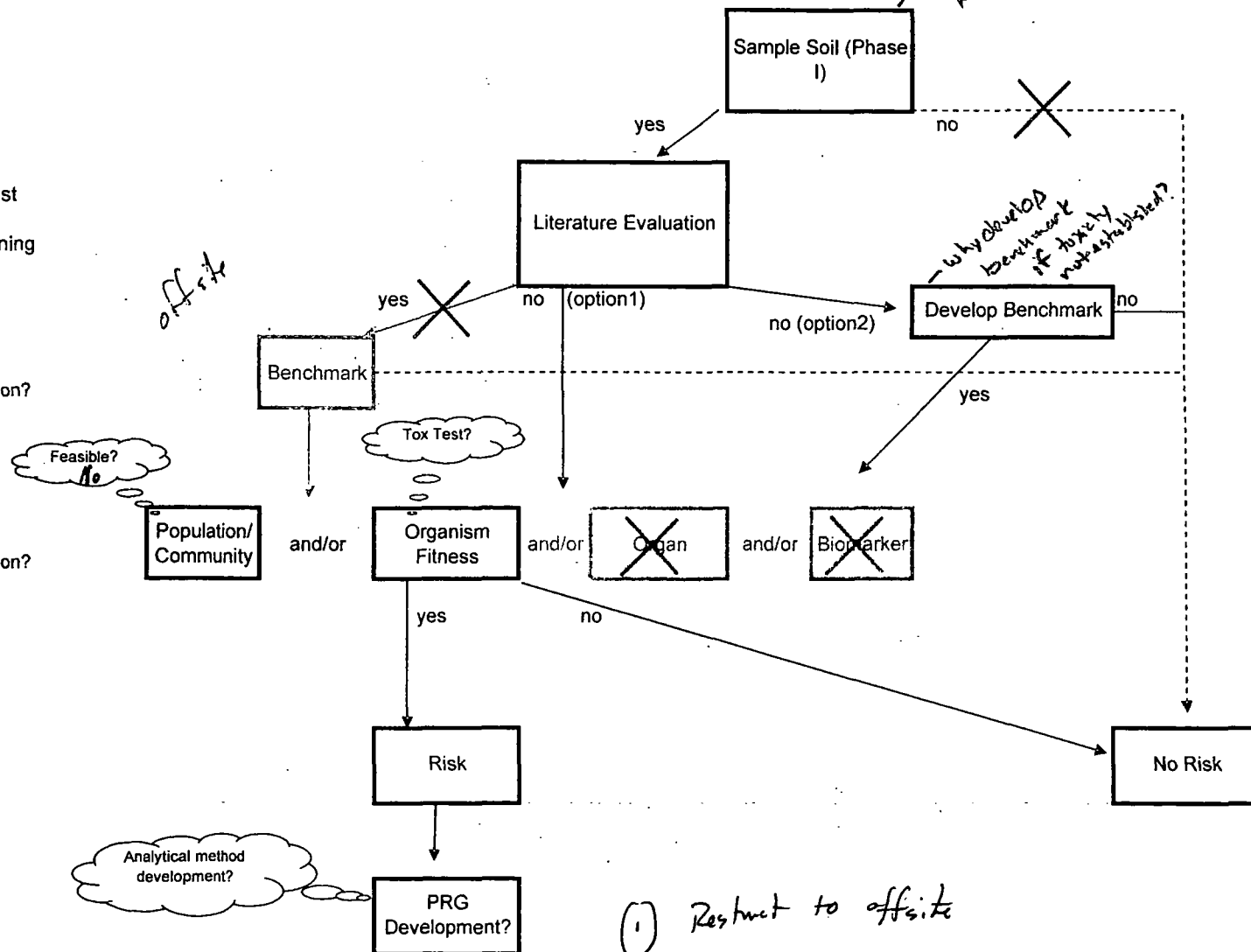
SCREEN

Q: Does data exist to develop an acceptable screening benchmark?

BASELINE

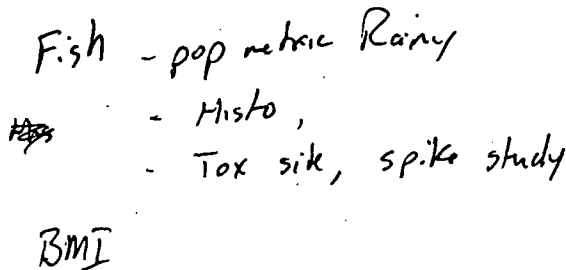
Q: Screening Level Effects Determination?

Q: Is exceedance relevant to population?



- (1) Restrict to offsite
- (2) Page on Food web - all receptor groups

Kootenai River?



Amphib

NATURE AND EXTENT

Q: Is exposure occurring?

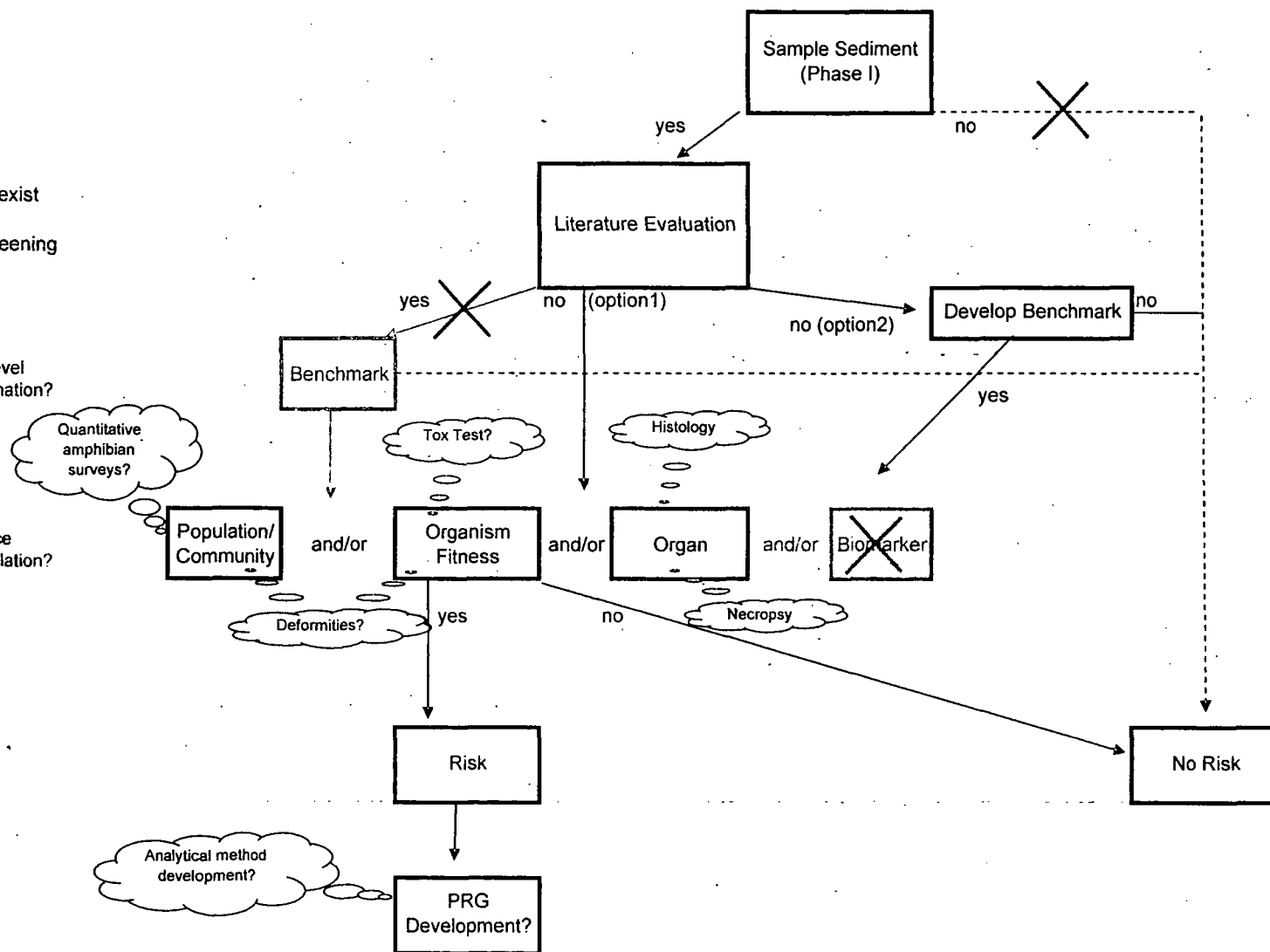
SCREEN

Q: Does data exist to develop an acceptable screening benchmark?

BASELINE

Q: Screening Level Effects Determination?

Q: Is exceedance relevant to population?



Avian

CSM Pathway
NATURE AND
EXTENT

Q: Is exposure
occurring?

Q: Does data exist
to develop an
acceptable screening
benchmark?

SCREEN

Q: Screening Level
Effects Determination?

BASELINE

Q: Is exceedance
relevant to population?

A thought. Could exposure be
considered our "benchmark"?
Assuming exposure is our
benchmark we would move to
baseline. We may have to use
histo and exposure data for the
screen but will not be able to
interpret population significance.
Therefore moving to baseline
might be reasonable

What tissues? Is
ingestion an issue we
can rule out?

Can we age the
animals reliably?

When do we
sample? What
age? Gender?

What species spend time
on site and are maximally
exposed?

Sample Tissue(s)
Along
Contamination
Gradient

yes
yes

no

Literature Evaluation

What level and type
of abnormalities
means move to
baseline?

yes

no

Extrapolation
from other
species - not
likely defensible

Benchmark

Histology

no

Evaluate
Existing
Demographic
Data

Q: Are Organisms
Absent that Should be
Present?

Is this a
feasible
endpoint?

Metabolic or
respiratory fitness

Reproduction -
bird boxes

Population/
Community

and/or
Organism
Fitness

and/or
Organ

and/or
Biomarker

DNA
strandbreaks?

Chromosomal
mutations?

Inflammatory
mediators?

How many
seasons will
this take?

Secondary
Stressor?

Laboratory
Study?

Predator
Avoidance?

Histology

Necropsy

Osteopontin?

Are bird
surveys
reasonably
quantitative
end point?

Risk

PRG
Development?

Analytical method
development?

What media is the
driver?

Avian ABS?

No Risk

Causality

Mammal Inhalation (& ingestion?)



NATURE AND EXTENT

Q: Is exposure occurring?

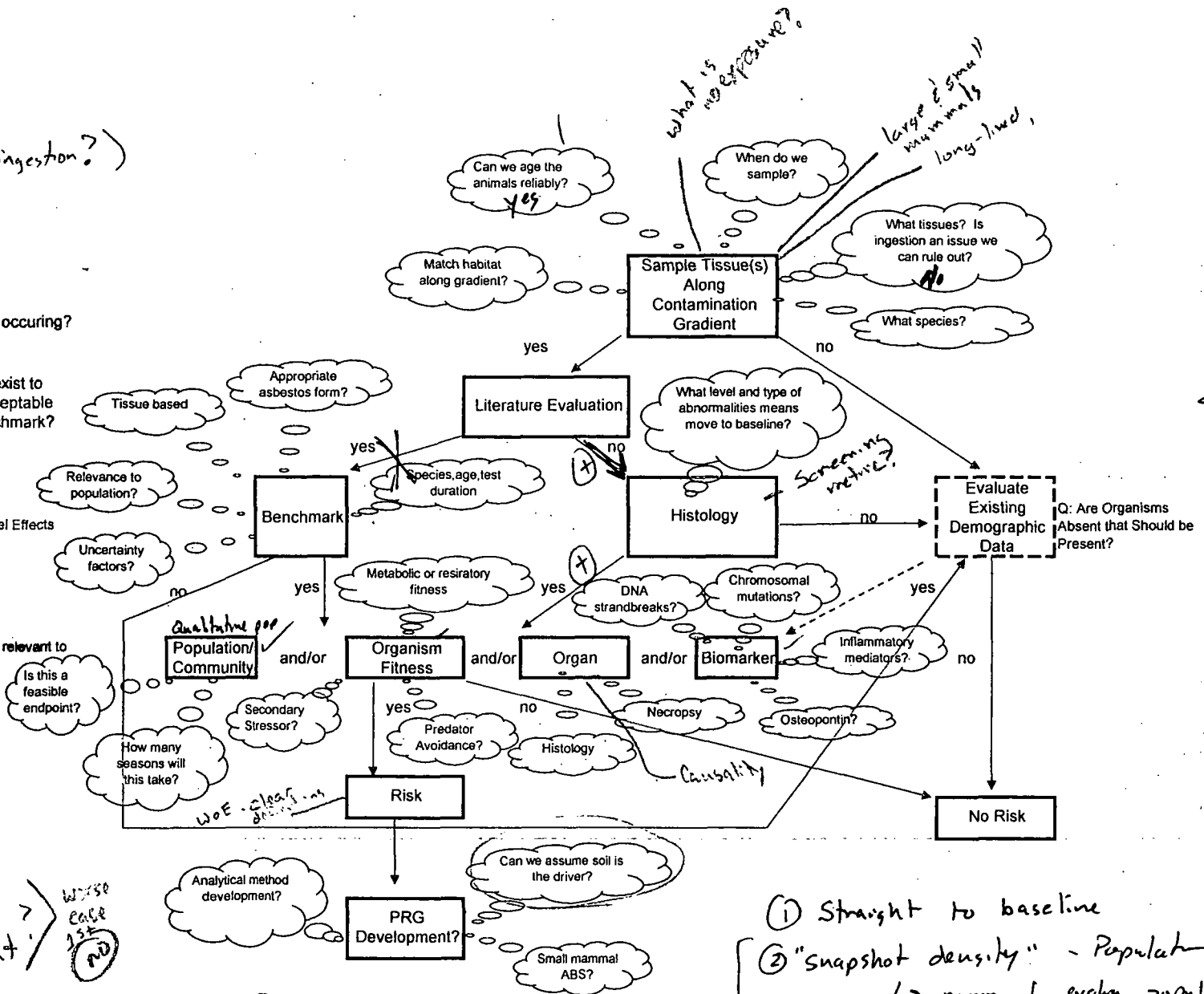
SCREEN

Q: Does data exist to develop an acceptable screening benchmark?

Q: Screening Level Effects Determination?

BASELINE

Q: Is exceedance relevant to population?



① Recap

② Recon event - species present?
 worse case 1st
 (20)

③ Extrapolate to medium/large mammals?

④ Reference Area - Disturbed? Gravel mines

⑤ Tech assistance Wildlife ecologist?

- Problem Formulation screen

① Straight to baseline

② "Snapshot density" - Population
 ↳ norm of existing population

③ Histo - Lungs

Amphib

NATURE AND EXTENT

Q: Is exposure occurring?

SCREEN

Q: Does data exist to develop an acceptable screening benchmark?

BASELINE

Q: Screening Level Effects Determination?

Q: Is exceedance relevant to population?

Steve Corn
USGS

Quantitative amphibian surveys?

Population/
Community

Tox Test?

Organism
Fitness

Deformities?

Histology

Organ

Necropsy

Biomarker

Risk

Analytical method development?

PRG
Development?

Sample
Soil/Sediment
(Phase I)

Used
Reference
area

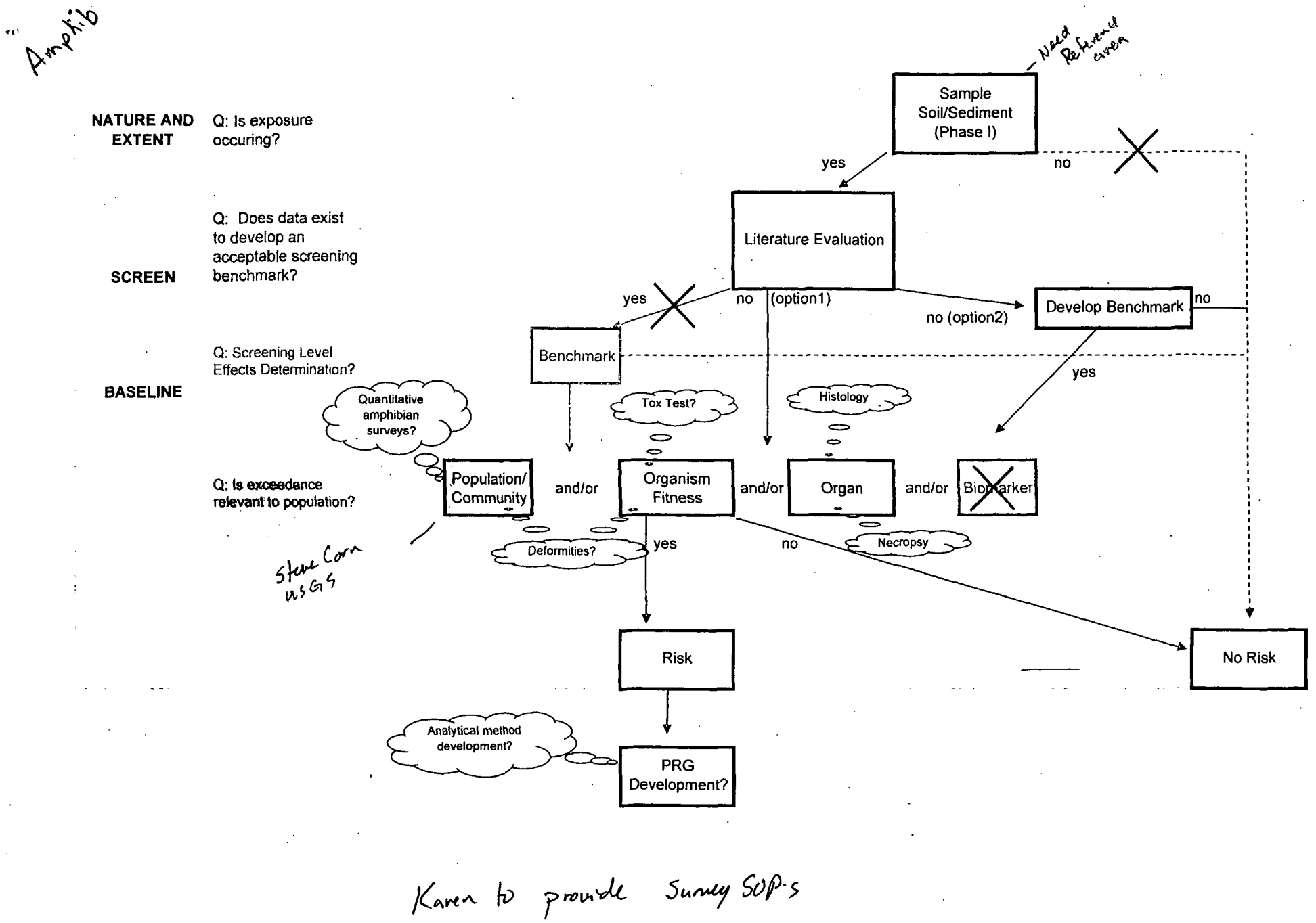
Literature Evaluation

Develop Benchmark

Benchmark

No Risk

Karen to provide Survey SOP's



Plant

